UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/716,920	11/19/2003	Kurt W. Kramarz	937-1533	6420

23117 7590 09/19/2006

NIXON & VANDERHYE, PC
901 NORTH GLEBE ROAD, 11TH FLOOR
ARLINGTON, VA 22203

EXAMINER	
KEYS, ROSALYND ANN	

ART UNIT	PAPER NUMBER
1621	

DATE MAILED: 09/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/716,920	KRAMARZ ET AL.	
	Examiner	Art Unit	
	Rosalynd Keys	1621	

– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-27 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-27 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date 11/19/03 & 7/2/04.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of Claims

1. Claims 1-27 are pending.

Claims 1-27 are rejected.

Information Disclosure Statement

2. The information disclosure statements (IDS's) submitted on November 19, 2003 and July 2, have been considered by the examiner.

Specification

3. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: The limitations of claims 4, 5 and 25-27 are supported in the specification. The limitations ethyltributylammonium, tetraethylammonium, tetrahexylammonium and tetrapropylammonium, as disclosed in claim 14 are not supported by the specification. The limitation potassium hydroxide as disclosed in claim 17 is not supported by the specification. The 100°C temperature limitation of claim 20 is not supported by the specification. The limitation a molar ratio of about 1 as disclosed in claim 24 is not supported by the specification.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-11, and 15-22 and 24-27 are rejected under 35 U.S.C. 102(b) as being anticipated by Judge et al. (UK 1 547 856).

Judge et al. teach preparation of at least one primary alcohol by the hydrogenation of an unsaturated aldehyde produced by an aqueous base-catalyzed aldol condensation reaction through the use of a phase-transfer catalyst (PTC) , including water-soluble PTC's (see entire disclosure, in particular page 1, line 7 to page 6, line 12 and the examples).

6. Claims 1, 10, 14-17, 20-22, and 24-27 are rejected under 35 U.S.C. 102(b) as being anticipated by Barker et al. (US 4,426,542).

Barker et al. teach the claimed invention in example 14.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various

claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 1-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Judge et al. (UK 1 547 856) in view of Starks et al. (Phase Transfer Catalysis, 1994, pp. 482-488) and Halpern et al. (Spec. Publ.-R. Soc. Chem, 1999, pp. 30-39).

Starks et al. teach the claimed invention as disclosed above, but fail to teach recovering the phase-transfer catalyst from the water washing by the addition of alkali metal hydroxide; a preference for use of the PTC having the cationic portion as disclosed in claim 14; nor the use of a three phase system.

Halpern et al. teach that there are several criteria to be considered when choosing a phase-transfer catalyst for a commercial phase-transfer catalysis application. The most important criteria are reactivity, separation of catalyst from the product, availability, the real cost of catalyst and solvent, method of environmentally acceptable disposal, catalyst stability and toxicity (see page 30). Halpern et al. compare three widely used PTCs, namely Aiquat®336 (methyl tricapryl ammonium bromide); Aliquat®100 (tetrabutyl ammonium bromide) and Aiquat®175 (methyl tributyl ammonium chloride). Halpern et al. teach that most PTC systems work at very high ionic strength, and that Aiquat®175 in particular, excels in PTC reactions using 50% NaOH. Halpern et al. teach that at these ionic strengths, even the most hydrophilic quat salts are salted out of the aqueous phase (see page 36). It is further taught on page 36 that in some cases with high ionic strength a third phase can be formed with tetrabutylammonium salts and a very high reactivity may be observed.

Starks et al. (see page 10 and pages 253-255) teach that tetrabutylammonium salts forms a third layer (phase) when used in conjunction with an organic phase that has little polarity and with a concentrated aqueous solution of inorganic salts. Starks et al. teach that in this situation, most of the reaction occurs in the third phase with both aqueous and organic reagent transferring to this phase for conversion, which allows for a faster reaction than with simple PTC reactions. Starks et al. teach that because formation of a third phase offers simplified catalyst removal and recovery procedures, third-phase catalysis is highly attractive for commercial operations.

One having ordinary skill in the art at the time the invention was made would have found it obvious to add sodium hydroxide in the claimed amounts to the water wash of Judge et al., since Halpern et al. teach that a high ionic strengths even the most hydrophilic quat salts are salted out of the aqueous phase. The skilled artisan would have been motivated to salt out the quat salt in order to recover the catalyst for reuse.

One having ordinary skill in the art at the time invention was made would have been motivated to select Aliquat®100 (tetrabutyl ammonium bromide) or Aiquat®175 (methyl tributyl ammonium chloride) over Aiquat®336 (methyl tricapryl ammonium bromide) in the process of Judge et al., since Halpern et al. teach that these two are the better choices when one desires to separate the catalyst by extraction into water or when an "accessible quat" is best (e.g. many alkylations and condensations of substrates with a pKa of 16-23), see pages 37 and 38).

One having ordinary skill in the art the time the invention was made would have been motivated to carry out the reaction of Judge et al. utilizing a third phase as taught Starks et al. and Halpern et al., since Starks et al. teach that third phase reactions may be faster than simple PTC reactions and formation of third phase offers simplified catalyst removal and recovery

procedures and Halpern et al. teach that very high reactivity may be observed with the use of a third phase.

Note: The Examiner has considered the comparative data given by Applicants but did not find that the results obtained were unexpected based upon the teachings of the prior art.

11. Claims 1, 11 and 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barker et al. (US 4,426,542) alone or in view of Halpern et al. (Spec. Publ.-R. Soc. Chem, 1999, pp. 30-39) or Judge et al. (UK 1 547 856).

Barker et al. teach the claimed invention as disclosed above but fail to teach removing the phase transfer catalyst by water washing.

Halpern et al. teach removal of quaternary ammonium salts from organic phase with water washing (see pages 34 and 35).

One having ordinary skill in the art at the time of the invention was made would have found it obvious to remove the PTC from the reaction product of Barker et al., by water washing the PTC as taught by Halpern et al., since Halpern et al. teach that water washing has been shown to be an effective means for extracting quaternary ammonium salts from an organic phase.

Barker et al. fail to teach using sodium hydroxide in a 10-50% weight solution.

Judge et al. teach an aldol concentration reaction wherein the alkali metal hydroxide solution is 4-50%, more preferably 5-15%, by weight (see page 3, liens 35-43).

One having ordinary skill in the art at the time the invention was made would have found it obvious to utilize an aqueous alkali metal solution, in the range taught by Judge et al., in the process of Barker et al., since Judge et al. has shown that this range is effective for use in aldol condensation reactions.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Brophy et al. (US 2004/0082804 A1) teach the application of multiphasic microchannel reactions to aldol condensations (see entire disclosure, in particular paragraph 0082).

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rosalynd Keys whose telephone number is 571-272-0639. The examiner can normally be reached on M-W & F 5:30-8:30 am & 1-5 pm;Th 5:30 am-5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thurman Page can be reached on 571-272-0602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Rosalynd Keys
Primary Examiner
Art Unit 1621

September 9, 2006